Title: An Evaluation of University of Wolverhampton Master of Pharmacy Students' Perceptions of Pharmacist Prescribing.

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Abstract

The Prescribers Survey Report 2016 identified 3944 annotated pharmacist prescribers on the General Pharmaceutical Council register in 2015 with 2567 independent prescribers; 425 are supplementary prescribers and 952 are both. This survey-based study evaluated the perceptions of University of Wolverhampton, Master of Pharmacy Students' about pharmacist independent prescribing. Ethical clearance was granted by the School of Pharmacy Ethics Board. A link to an online survey was sent to all students enrolled in the Master of Pharmacy course. The anonymous data was analysed thematically.

Cohort-dependant variations were identified, with year 1 and 2 students more informed about independent prescribing and including it in their career plans. Students in year 3 and 4 were more likely to pursue the career if it was appealing after graduation. This may be due to the course workload in year 3 and 4 plus another year of internship, making further study unappealing at that time.

Key words: independent prescribing; pharmacist prescribers; pharmacy education; post graduate pharmacy education; clinical assessment skills

Introduction

In the United Kingdom (UK) the concept of pharmacist prescribing was introduced in 2003; firstly, with supplementary prescribers, where pharmacists could implement an agreed patient-specific management plan under a partnership with an independent prescriber (Tonna, Stewart, West, & McCaig, 2007). The pharmacist independent prescribing role was created in 2006 with power to prescribe a range of drugs autonomously 'for any condition within their clinical competence,' excluding controlled drugs. Pharmacist prescribing has since broadened to include controlled drugs (General Pharmaceutical Council, 2016). An independent pharmacist prescriber is currently defined as: a pharmacist who is responsible and accountable for the assessment of patients with undiagnosed and diagnosed conditions, and for decisions about their clinical management, including prescribing (MHRA, 2017).

According to the Prescribers Survey Report 2016, there were 3944 annotated prescribers on the General Pharmaceutical Council (2015) register in 2015; of whom 2567 were independent prescribers, 425 were supplementary prescribers and 952 were both independent and supplementary prescribers.

Studying Canadian and Australian pharmacy students' perceptions on pharmacist prescribing, Charrois et al., (Charrois, Rosenthal, Hoti, & Hughes, 2013) used interviews covering four themes;

1) Benefits examined the advantages of having prescribing pharmacists in the healthcare system, to patients and as professionals.
2) Fears discussed concerns and anxieties students may face in a prescribing environment.
3) Needs identified key areas that pharmacy students require for them to feel comfortable in a prescribing role.

4) Pharmacist roles discussed how pharmacy students perceive the roles of pharmacist prescribers fitting into the healthcare system, which includes role limitations and separation of roles from other health care professions, as well as separation of roles within the profession of pharmacy.

Three focus groups were conducted at the University of Alberta, Canada (n=5-7 students per group) and four at Curtin University, Australia (n=3-9 students per group). The study found Australian students felt more comfortable with the role of supplementary prescribing, whereas Canadians students disagreed and felt that independent prescribing was a better choice than supplementary prescribing as it allowed the profession to move forward. There were many similarities between the two groups with regards to benefits and fears, including the fear of physician backlash and blurring of professional roles (Charrois, Rosenthal, Hoti, & Hughes, 2013).

Whilst research has been completed regarding attitudes towards pharmacist prescribing from the perspective of patients, practicing pharmacists, physicians and nurses, there is currently no published literature regarding UK pharmacy student perceptions.

As set out in the 2017 NHS England report 'General Practice, Forward View' the increasing numbers of patients with non-communicable diseases, maintained on ongoing medication means a further increase in prescriber numbers is still required. There is also further reflection on what the optimal role, and consequently training of future prescribers should be (NHS England, 2016).

Methods

Aim and Objectives

This study aimed to evaluate the perceptions of University of Wolverhampton Pharmacy students on pharmacist prescribing.

The objectives were:

1. Explore when and how pharmacy students become aware of pharmacist prescribing.
2. Explore pharmacy students' intentions around becoming an independent prescriber in the future.
3. Evaluate their perceptions on the benefits associated with becoming an independent prescriber.
4. Evaluate their fears associated with becoming an independent prescriber.
5. Compare perceptions from each cohort regarding objectives 1- 4.

Ethics approval

Ethical approval was received from the School of Pharmacy Ethics Review Board, University of Wolverhampton.

Data collection

An online 4-part survey was used to collect pharmacy students' perceptions. The survey questions (n=15) were derived from published literature (Appendix 1).

Consent was indicated by logging in and undertaking the survey. No individual identifiers were required or collected at any stage. Only the researcher and supervisor had access to the collected data, which was transferred to a password protected Microsoft Excel™ master spreadsheet. This study used qualitative thematic analysis. It provided a structured methodology in identifying key themes within the raw data and was not restricted by singular specific perception (Boyatzis, 1998).

Study Sample

All current pharmacy students at the University of Wolverhampton were invited to participate. The questionnaire and participant information sheet were distributed at a face-

to-face session. An email containing the participant information sheet and a link to an online survey using Google Forms™ was sent to each cohort just before the designated session began. Participants were only able to the access the survey during the session.

Results

In total, 132 pharmacy students completed the online survey; 32 students from year 1 (40%), 38 from year 2 (40%), 29 from year 3 (45%) and 33 from year 4 (50%). The data obtained was further segregated into the corresponding topics.

Awareness of pharmacist independent prescribing

Table 1 shows that students who entered the MPharm course most recently (1st year 40.6% and 2nd year 47.4%) were more aware of pharmacist prescribing role than those who entered the course earlier (3rd year (20.7% and 4th year 12%).

Insert table 1 here

Two major themes were identified in how pharmacy students became aware of pharmacists prescribing independently: 'Education; the pharmacy course' and 'Personal relationships; with someone in the student's family or circle of friends who are independent prescribers'. These two themes were considered to be frequent within all cohorts.

A total of 68 students responded within the theme of education, where the highest source of information was "lectures". The education theme featured strongly in the third year pharmacy students' response (62.1%) in comparison to 46.9%, 47.4%, and 51.5% in year 1, 2 and 4 respectively. Personal relationships involved human interactions with others (excluding lecturers); in total, 29 students proposed a theme similar to personal relationships in the online survey. This theme was more prevalent in year 2 pharmacy students responses selected by 28.9%, in contrast to 18.8%, 20.7% and 18.2% in year 1, 3 and 4 respectively.

The analysis explored themes about why pharmacy students consider a career in independent prescribing. Two main themes were identified; Beliefs; the students' opinions regarding the capability and appropriateness of pharmacists in prescribing and Future directions; the student plans to be an independent prescriber. The theme of 'Beliefs' was further separated into three sub-themes; personal interest, morals and patient-centred care. Future directions were divided into 3 sub-themes; career development, financial aspect and clinical knowledge development (Figure 1).

In the 'Beliefs' theme, a total of 97 (28.6%, 43.3%, 38.1% 56% in years 1, 2, 3 and 4 respectively) pharmacy students responded from all years, 33% of those who responded found the idea of pharmacist prescribing challenging but an interesting career option.

"Sounds challenging so would like to give it a go" (Student 1, year 1)

Career development was selected by 37 students out of all responses (38.1%, 26.7%, 28.6%, and 20% in years 1, 2, 3 and 4 respectively)

"It is the next step in pharmacy after the Master degree". (Student 2, year 4)

Insert Figure 1 here

Barriers

Theoretical barriers to becoming an independent prescriber were listed for the students to select. In total, 78 students responded and three major themes were identified; 'Availability of *opportunities*', 'negative *behaviours*' and '*Education* – low grade and poor clinical knowledge' (Figure 2).

Finding time while working full time was the major theme that students perceived as a barrier (30.8%) to undertaking the prescribing course in general, in comparison to other reasons within the 'opportunities' theme and overall (25%, 12.5%, 20.8% and 41.6% year 1,

2, 3 and 4 respectively). Time was perceived by many students the inability to attend the prescribing course e.g.:

"Not enough time when I am working" (Student 3, year 4)

"Time would be the biggest factor" (Student 4, year 4)

"Time would be the biggest barrier" (Student 5, year 1)

In the 'Behaviours' theme section, stress was the most selected emotion (11.5%) the majority were from first year (55.6% 1st year, 22.2% in both year 2 and 3 and 0% 4th year).

"Workload stress" (Student 6, year 1)

The education theme involved the perceptions of education level and skills as a barrier for pharmacy students becoming independent prescribers. Students perceived clinical knowledge as a the most important component required to becoming an independent prescriber, and that the pharmacist the level of clinical knowledge will in turn is a factor that acts as a barrier (9.5%, 11.1%, 14.8% 41.4% in year 1, 2, 3 and 4 respectively).

"Clinical knowledge must be very good." (Student 7, year 4)

Pharmacy student's (48%) feared that they may not meet the medical primary care team 'behavioural expectations' with 'misdiagnosis/ prescription errors' was the highest stated reason (61%, 46.7%, 76.9% and 36% in year 1, 2, 3 and 4 respectively).

"Making a prescribing error and then harming patient" (Student 20, year 3)

"Making error, having the license being taken away" (Student 21, year 3)

"Making a mistake that causes harm to a patient" (Student 22, year 3)

"Errors leading to prosecution" (Student 23, year 2)

Insert Figure 2 here

Benefits of pharmacists becoming independent prescribers

This section investigated pharmacy students' perceptions on how independent pharmacist prescribers benefit the pharmacist, patients and other healthcare professionals

There were 91 responses about the benefits for pharmacists section with 'career expectations' identified as the main reason throughout all cohorts (Figure 3).

The career expectations theme was established as a result of repetition of phrases that corresponded to future endeavours and gains in a career. Salary was a highly prevalent reason that the majority of students selected as an answer (n= 29) (47.6%, 24%, 33.3% and 20.8% in years 1, 2, 3 and 4 respectively).

"Increase salary" (Student 8, year 1)

"Better salary" (Student 9, year 1)

"Get paid more" (Student 10, year 1)

Clinical knowledge development was the second most prevalent selected reason (25 pharmacy students) to do the clinical prescribing course (12.5%, 40%, 29.2% and 20.8% in years 1, 2, 3 and 4 respectively).

"Being up to date with clinical knowledge and being exposed to a lot of different clinical conditions and scenarios" (Student 11, year 2)

The 'benefits for patients' section was answered by 94 students with 'service enhancement' as the main reason which was defined as a beneficial change brought about to existing services, due to pharmacist prescribing.

Out of all pharmacy students participants 47.7% stated that by having pharmacists as independent prescribers there will be a reduction in patient waiting time at medical practices in primary care (55%, 34.6%, 35% and 57.1 in years 1, 2, 3 and 4 respectively.

"Reduced waiting time at the surgery" (Student 12, year 4)

"They don't have to wait to see the doctors" (Student 13, year 4)

"Reduce waiting times for patients" (Student 14, year 4)

Overall, 90 pharmacy students responded concerning the benefits for healthcare professionals section. The main reason selected was 'Roles'. The majority of responses revolved around the positive impact that the role an independent prescribing pharmacist could have on other healthcare professionals (Figure 3).

In total 34.4% of pharmacy students believed that the role of independent prescribing pharmacist could be beneficial in relieving GPs work-related pressure/stress (23.5%, 33.3%, 27.8% and 46.4% in years 1, 2, 3 and 4 respectively). In addition, 35% pharmacy students believed that the roles of health professionals will overlap.

"Pressure taken off GPs and nurse prescribers" (Student 15, year 4)

"Less pressure and stress on GPs" (Student 16, year 4)

"Takes the pressure off of them so they can prioritise others easily" (Student 17, year 4)

"Doctor would have less workload on minor aliments therefore freeing time for more serious problems." (Student 18, year 4)

"Doctors will have more time to see each patient than the conventional time; doctors won't have to take the whole burden of the patients because that will get distributed" (Student 19, year 4)

Insert Figure 3 here

Discussion

The responses indicate the majority of pharmacy students became aware of the independent prescribing career pathway during their course rather than before starting the course and the main contributing factor for this result was education. The most cited form of education was via their classes (52.5%).

This study also investigated how many pharmacy students considered a career in independent prescribing and the reasons behind their choice; there were 79.3% of pharmacy students considering a career progression as independent prescribers. Personal interest in completing the independent prescribing course was found to be the major contributing factor in the university pharmacy students' cohort (years 1-4), although this cannot be generalised for future cohorts or cohorts at other universities.

Some barriers to becoming independent prescribers were identified. Time was identified as the major barrier theme and it was associated with inability to attend the course while working full time. It was more prevalent within fourth year pharmacy students than any other year.

Salary and clinical knowledge development themes were identified as the most prevalent topics proposed by pharmacy students in the survey when asked about the benefits of pharmacist prescribers to pharmacists, patients and other healthcare professionals. The salary theme was interpreted by pharmacy students as financial stability for the pharmacist due to higher wages associated with the role. Development of clinical knowledge was seen as benefit of undertaking the independent prescribing course due to the 90 hours patient-facing clinical work, with medical supervision in a medical practice (real-world practice), which is lacking in the undergraduate course where therapeutics and clinical knowledge are all taught theoretically or as role playing. Patient benefit was identified as 'enhanced primary care services' via the reduction in patient waiting time for appointments. This is mainly due to the boost of the number of prescribers employed in medical practices. Pharmacy students in the Charrois et al., (2013) study had similar perceptions to Wolverhampton pharmacy students on the benefits of pharmacist prescribing to the patient population, which suggests this concept is widely shared by pharmacy students. Therefore, Pharmacy students perceived that the independent prescribing role would lead to workload being distributed between GPs and pharmacist prescribers and accordingly improve GP workload pressure and associated stress.

Concerns have been expressed about the pharmacists' lack of diagnostic skills and competence to prescribe in published literature, which has suggested workload distribution, would not be even as thought by students, as the role itself may be a burden on healthcare professionals leading to more pressure and workload (Tonna et al., 2007).

In addition to the benefits of independent prescribing, perceptions on fear were also evaluated, with a large proportion of pharmacy students expressing concerns about 'misdiagnosis/ prescription errors'. This theme was perceived by students as a fear of the consequences of making errors which could result in prosecution or patient harm. Furthermore, in the Tonna et al., 2007 study healthcare professionals were concerned about the pharmacist's lack of diagnostic skills was also raised which concedes with pharmacy student's perception (Tonna, A.P., Stewart, D., West, B. & McCaig, D. 2007).

However, a review by Hinchcliffe (Hinchcliffe, 2015) stated: "*Service evaluations have identified the following benefits from the introduction of pharmacist independent prescribing: reduction in prescribing errors, medicines optimisation, reduced admissions/ readmissions and referrals, pharmaceutical care issues being resolved more quickly, reduced length of hospital stay and delays to discharge, and freeing up of medical time."* However, it also noted; "*No high level research studies (e.g. RCT, meta-analysis, cohort studies) were identified in the literature search."* Further research is required but the concerns expressed by Tonna have so far not been identified in practice (Tonna, A.P., Stewart, D., West, B. & McCaig, D., 2007)

A study on prescribing errors by prescribing pharmacists concluded that prescribing pharmacists provide a valuable role in safe prescribing (Baqir, W., Crehan, O., Murray, R., Campbell, D. & Copeland, R., 2014). Moreover, current software has been produced to develop clinical knowledge in students but have not been utilised effectively in pharmacy schools. The British Pharmacological Society has previously launched such software called e-Prescribe, which aims to develop a firm understanding in the principles of basic and clinical pharmacology in healthcare students, thus promoting safe and effective prescribing (McIntosh, Munro, McLay, & Stewart, 2012).

Limitations

The sample size was small; therefore, the results may not represent all Wolverhampton pharmacy students' views. Moreover, the results obtained from one university may not be representative of UK pharmacy student's views. The results obtained from the survey lacked depth of explanation which reduced the effectiveness of thematic analysis. This study failed to explore perceptions in depth of students who did not consider a career in prescribing.

Conclusion

Pharmacy education needs to be inclusive in making students aware of all possible career options and include training on those roles in the undergraduate courses rather than only concentrating on hospital and community career options. Furthermore, personal interest is a major factor that motivates pharmacy students in considering a career in prescribing, which implies that prescribing should be an option for those interested and not a compulsory role for all pharmacists. Future larger study should be considered to evaluate all involved parties perceptions and concerns including the undergraduate pharmacy students and educators, registered pharmacists, independent prescribing pharmacists, GPs and most importantly the service users.

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Table 1: Students' awareness of pharmacists prescribing

Total respondents (n=132)	Before starting the course	During year 1 (includes before year 2 starts)	During year 2 (includes before year 3 starts)	During year 3 (includes before year 4 starts)	Total aware by the end of first year
Year 1 (n=32)	13	13	0	0	26 (81%)
Year 2 (n=38)	18	16	4	0	34 (89.4%)
Year 3 (n=29)	6	15	7	1	21 (72.4%)
Year 4 (n=33)	4	8	11	10	12 (36.4%)

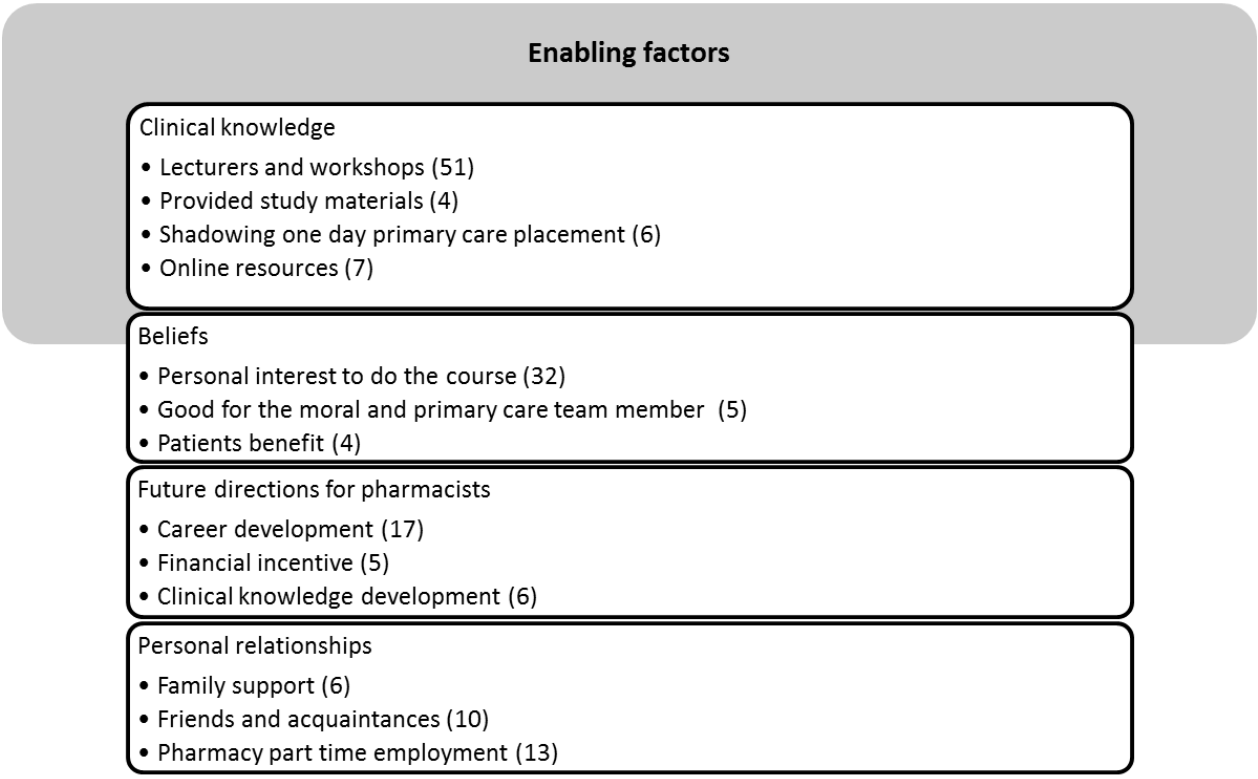

Figure 1: Enabling factors by frequencies

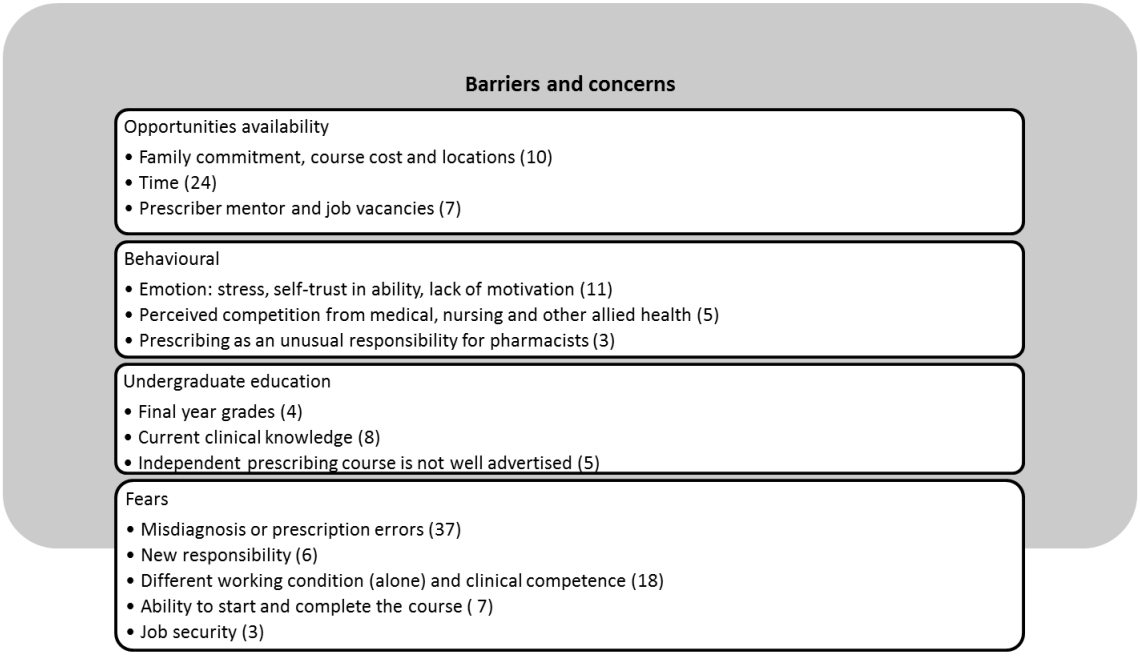

Figure 2: barriers theme map by frequencies.

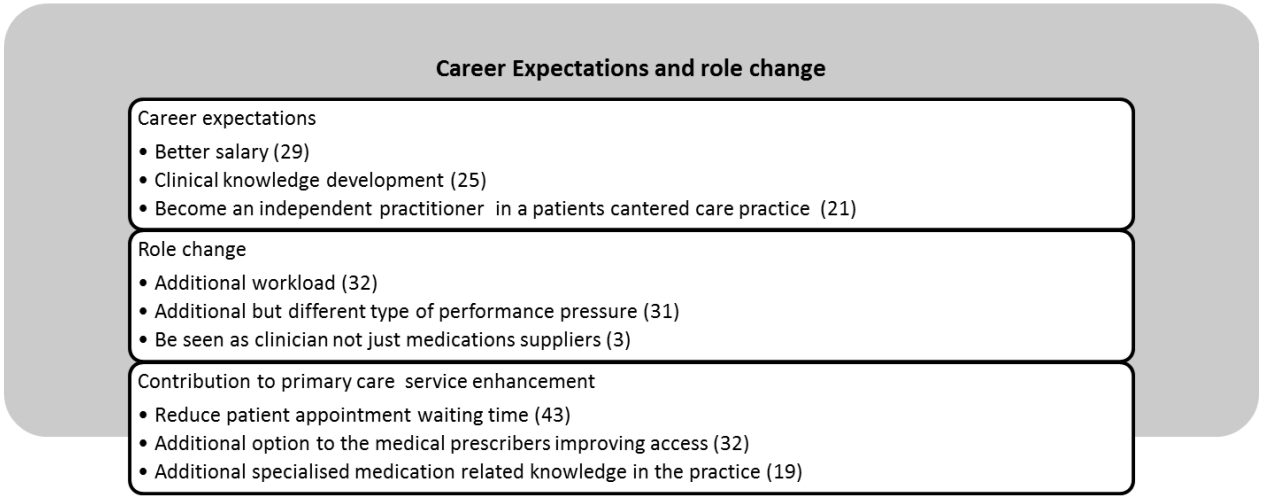

Figure 3: Career Expectations theme map by frequencies

Appendix 1 - Online survey questions

If you prefer not answer any questions please leave the comment box blank or select prefer not say where provided.

1. Which cohort do you belong to?
   a. Year 1
   b. Year 2
   c. Year 3
   d. Year 4

Awareness of pharmacist independent prescribing

2. When did you first find out that it was possible for pharmacists to become independent prescribers?
   a. Before starting the course
   b. During year 1 (includes before year 2 starts)
   c. During year 2 (includes before year 3 starts)
   d. During year 3 (includes before year 4 starts)
   e. During year 4
   f. I wasn't aware of this until completing this questionnaire

3. How did you first find out about independent pharmacist prescribing?

Becoming an Independent Prescriber

4. Have you **ever** considered a career in independent prescribing?
   Y/N/don't know/prefer not say
5. Please explain your answer to question 4?

6. If you answered yes to question 4, are you still **currently** considering a career in independent prescribing?
   Y/N/don't know/prefer not say

7. If your opinion on wanting to become an independent prescriber has changed, please explain why?

8. What barriers do you think you might face in becoming an independent prescriber?

9. Which barrier from your list do you think is the biggest contributing factor?

Benefits of pharmacist independent prescribing

10. What benefits do you think there are **for pharmacists** in becoming an independent prescriber?

11. What benefits do you think there are **for patients** in pharmacists becoming an independent prescriber?

12. What benefits do you think there are **for other healthcare professionals** in pharmacists becoming an independent prescriber?

Fears

13. What fears do you have about becoming an independent prescriber?

14. Which fear from your list do you think is the biggest contributing factor?